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ABSTRACT

This module on the integumentary system is one of eight modules designed for individualized instruction in health occupations education programs at both the secondary and postsecondary levels. This module contains an introduction to the module topic, objectives (e.g., list and describe the types of glands formed in the skin, and explain the significance of their production of bodily secretions), and five learning experiences. Each learning experience contians an overview, two to four learning activities (e.g., investigate different types of suntan lotions), information sheets, and a student self-check with model answers. Concluding the module is a student performance assessment form to be completed by the instructor. (JH)

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ED173668

HEALTH OCCUPATIONS

MODULE

THE INTEGUMENTARY SYSTEM

DEPARTMENT OF VOCATIONAL EDUCATION

Temple University

of the Commonwealth System of Higher Education

Philadelphia, Pennsylvania

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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HEALTH OCCUPATIONS

MODULE

For the teacher...

ABOUT THE MODULE

DEPARTMENT OF VOCATIONAL EDUCATION

Temple University
of the Commonwealth System of Higher Education

Philadelphia, Pennsylvania

CE 022 033

January, 1977

CONTENTS

ORGANIZATION ..... p. 1

PROCEDURE 1

TERMINOLOGY 2

For the teacher...

ABOUT THE MODULE

ORGANIZATION

Each module is designed to help the student to gain competence in an area considered important in health occupations.

Each module contains an introduction and a series of learning experiences. Overviews, which precede each learning experience except the final one, provide at a glance brief descriptions of what each learning experience entails.

Two types of objectives form the basis of the learning experiences: a terminal objective and enabling objectives. The enabling objectives are designed to help the student achieve the terminal objective. Each learning experience has activities designed to facilitate accomplishing the objective, and by use of the feedback devices provided, the student should be able to determine if he/she has reached each objective.

The first learning experience is designed to provide the needed background information. The remaining learning experiences are designed to provide the opportunity to apply that information in a practice situation. The final learning experience always requires the demonstration of the skill in an actual school situation.

PROCEDURE

1) Briefly discuss the purpose of the module.

2) Direct the students to review the introduction, the objectives and overviews preceding each learning experience, including the final learning experience.

3) The student needs to complete only those modules and/or learning experiences covering skills he/she does not already possess.

4) Answer the questions related to the module.

5) If the student decides that he/she is already competent in the specified area, provide him/her with an opportunity to "test out." Administer the "Final Learning Experience."

6) Instruct students who do not have the competencies indicated, to complete the module.

7) In cooperation with the student, determine a schedule for completing the module.

8) Instruct the student to make the necessary arrangements with you, the resource person, when he/she is ready to take the final learning experience.

9) If the student is unsuccessful in completing the final experience, instruct him/her to meet with you, the resource person, in order to provide for recycling through the module, or for completing some other activity suggested by the student or resource person and commonly agreed upon.

TERMINOLOGY

Actual School Situation -- refers to a situation in which one is actually a student in a real school.

Occupational Specialty Area -- refers to the student's major area of emphasis within the health occupations program.

Peers -- refers to fellow students who are used to:
1) role-play students, etc.,
2) critique the student's performance, and
3) participate in discussions.

Unless otherwise specified, these peers should be persons within the student's own occupational specialty.

Resource Person, Instructor -- refers to the person in charge of the student's educational program, i.e., the teacher who is guiding the student in taking the module.

You, Student -- refers to the person who is taking the module.

HEALTH OCCUPATIONS MODULE

designed for the purpose
of individualizing instruction
in the health related occupations
program.

Prepared by...

Temple University of the Commonwealth System of Higher Education
Philadelphia, Pennsylvania

DEPARTMENT OF VOCATIONAL EDUCATION

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In conjunction with...

The Pennsylvania Department of Education

BUREAU OF VOCATIONAL EDUCATION

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PREREQUISITE

There are no prerequisites to this module.

CONTENTS

INTRODUCTION..... 1

MODULE STRUCTURE AND USE

Organization..... 1
Objectives..... 1
Procedure..... 1
Resources..... 2
Terminology..... 2

LEARNING EXPERIENCE I

Overview..... 3
Activities..... 3
Feedback -- Self Check -- Model Answers..... 4

LEARNING EXPERIENCE II

Overview..... 6
Activities..... 6
Feedback -- Self Check -- Model Answers..... 9

LEARNING EXPERIENCE III

Overview..... 12
Activities..... 12
Feedback -- Self Check -- Model Answers..... 13

LEARNING EXPERIENCE IV

Overview..... 15
Activities..... 15
Feedback -- Self Check -- Model Answers..... 17

LEARNING EXPERIENCE V

Overview..... 19
Activities..... 19
Feedback -- Self Check -- Model Answers..... 20

ASSESSMENT FORM..... 22

Introduction

Increasingly complex and specialized health occupations demand well-prepared health care workers. The structure and function of the human body are important areas of the curriculum common to all health careers. Job skills, occupational advancement and advanced education are based on a solid foundation of information about anatomy and physiology and related sciences. In addition, the common language of medical terminology binds all health care workers together.

The information which follows is directed toward beginning health care workers and their need for a concise, readable and understandable introduction to the scientific basis upon which their career is founded. It is written for all the health occupations and does not treat health and disease from any one health career perspective.

This module emphasizes normal anatomy and physiology of the integumentary system. Thus, the purpose of this module is to help you to demonstrate competence in knowledge of the integument (skin), which covers the outer surface of the body.

Module Structure and Use

Organization

This module contains an introduction and five sequential learning experiences. Overviews, which precede each learning experience, provide at a glance brief descriptions of what each learning experience entails.

Two types of objectives form the basis of the learning experiences: a terminal objective and enabling objectives. The enabling objectives are designed to help you achieve the terminal objective. Each learning experience has activities to help you accomplish the objective, and by use of the feedback devices provided, you should be able to determine if you have reached each objective.

The learning experiences are designed to provide you with the needed background information and the opportunities to apply that information in practice situations.

Objectives This module includes six objectives:

Terminal Objective

In an actual school situation (upon completion of this module), you will demonstrate competence in the knowledge of the integumentary system.

Enabling Objectives

1. You will define the integumentary system. (Learning Experience I.)
2. You will list the functions of the skin. (Learning Experience II.)
3. You will list and describe the structural layers of the skin and the types of tissue contained within. (Learning Experience III.)
4. You will identify and describe an individual hair structure, state the function of hair on the human body, and identify and describe the structure of the nail. (Learning Experience IV.)
5. You will list and describe the types of glands formed in the skin and explain the significance of their production of bodily secretions according to location, function or action. (Learning Experience V.)

Procedure

After reading the "Introduction,"

p. 1, and the "Objectives," p. 1, you should be able to determine how much of this module you will need to complete in order to be competent in the knowledge of the integumentary system.

* If you already have the necessary background knowledge required for proficiency in knowledge of the integumentary system, you may not need to complete all the learning experiences.

* You may wish to skim the overviews for the learning experiences and complete the "Self Check" questions associated with each of the experiences. In addition, you may wish to compare your answers with the "Model Answers" which are provided with each learning experience.

Resources

Listed below are the outside resources which supplement those contained within the module. Check with your teacher to determine the availability and location of the resources.

* If you choose to view the skin microscopically, ask your teacher for available slides and microscope.

* If you choose to view slides or films regarding information about the integumentary system, contact your teacher.

* If you choose to read additional information regarding the integumentary system, contact your teacher.

Terminology

Optional Activity or Optional Feedback -- refers to an item which is not required, but which is designed to supplement and enrich the required items in a learning experience.

You -- refers to the person who is taking the module.

Teacher or Resource Person -- refers to the person in charge of your educational program, the instructor who is guiding you in taking this module.

Student or Classmate -- refers to someone who is in your class and is also taking this module.

Learning Experience I

Overview

Enabling Objective After completing the required reading, define the integumentary system.

Activity 1 Read selected passages in your text-book, as assigned by your instructor/resource person, pertaining to the integumentary system.

Optional Activity In addition to reading the "Information Sheet Defining the Integumentary System," p. 3 , ask your teacher for additional readings on the integumentary system.

Activity 2 Demonstrate knowledge of the definition of the integumentary system by completing the "Self Check," p.4.

Feedback Evaluate your performance by comparing your completed "Self Check" with the "Model Answers," p.5.

(Activity 1)

Information Sheet for Defining the Integumentary System

The integumentary system consists of the skin and appendages (distinct additions) of the skin.

The outer surface of the body is covered by the skin (integument), which is considered to be the largest organ of the body. Not only does it stretch over the entire bodily surface, but it also contributes to the mucous membrane of the mouth, nose, anus, vagina and urethra. The skin is a flexible, elastic structure which has a remarkable ability to repair itself.

The scientific study of the skin is called dermatology. A dermatologist is a doctor who specializes in the treatment of skin disorders.

Optional Activity If you wish to read additional information about the integumentary system, ask your teacher.

(Activity 2)

"SELF CHECK"

1. Another name for the skin is _____.

2. Name the largest organ of the body. _____.

3. Describe briefly the areas of the body included within the integumentary system. _____.

4. List three properties of the skin.

   1) _____
   2) _____
   3) _____

5. The scientific study of the skin is called _____.

6. A "skin doctor" is called a _____.

Learning Experience II

Overview

Enabling Objective	After completing the required readings, list the functions of the skin.
Activity 1	Read assigned, selective readings in your text, plus the "Information Sheet on the Functions of the Skin," p. 6.
Optional Activity	Ask your teacher for additional readings on the functions of the skin.
Activity 2	Observe your own body and investigate different kinds of skin discoloration. Determine the causes which bring about these changes.
Feedback	If you choose to observe your skin, you will be observing many kinds of physiological changes within the body. Discuss your findings with your resource person.
Optional Feedback	Compare the findings of your skin observation with your classmates' observations. Discuss the findings with your resource person.
Activity 3	Investigate different types of suntan lotions, and determine why some lotions do a better job than others.
Optional Activity	Observe your skin as you perspire, and determine if under this condition your body loses or retains body heat.
Activity 4	For information regarding the functions of the skin, read the "Information Sheet."

(Activity 1)

Information Sheet on the Functions of the Skin

The skin functions in several ways:

1. It helps to protect the body.

The skin serves as a physical barrier, a mechanical barrier, a chemical barrier and a light barrier. Its surface is not a satisfactory place for many microorganisms to live upon, inasmuch as it is slightly acidic. It is believed that sweat and sebaceous (oil) gland secretions interfere with bacterial growth. Therefore, the skin prevents most microorganisms and other foreign substances from entering the body. However, there are some microorganisms which do manage to cross the skin barriers and the skin environment. Bacteria, fungi and viruses normally live on the skin. These organisms can not be completely removed from the skin no matter how much it may be cleaned. The organisms living on the skin become a serious threat only when they enter the body through a cut or sore, or when a change in the skin's environment allows them to multiply rapidly.

One type of harmful bacteria normally growing on the skin is Staphylococcus Aureus, commonly known as "Staph." This bacterium causes certain infectious diseases, pimples and boils. A highly contagious skin infection caused by the Staphylococcus or Streptococcus organism is called Impetigo. It most commonly appears as a reddened and blistered area which breaks open and leaves sticky, yellow pus-filled crusts, normally found upon the face and hands. Treatment must be prescribed by a doctor.

The condition known as "Athlete's Foot" is caused by a fungus which normal-

Feedback

Compare your written answers on the "Self Check" with the model answers.

MODEL ANSWERS

1. The medical term which means skin is integument.

2. The largest organ of the body is the skin.

3. The skin stretches over the entire bodily surface, and it also contributes to the mucous membranes of the openings of the body, such as the mouth, nose, anus, vagina and urethra.

4. Among the properties of the skin are that:

   1) it is flexible.
   2) it has an elastic structure.
   3) it has the ability to repair itself.

5. The scientific study of the skin is called dermatology.

6. A "skin doctor" is called a dermatologist.

ly lives on the skin. It attacks the skin between the toes, appearing as watery blisters which break and become moist, weeping spots that burn and itch. This organism is found on the floors of public baths and showers, such as those found in school buildings, and it grows rapidly in any damp place.

The protein found within the skin cell is knows as keratin. It helps to protect the body surface from chemical and physical agents. The skin prevents most chemicals from entering the body -- with the exception of mercury and nickel, which are highly poisonous metals. Gases can also be absorbed into the blood vessels beneath the skin. In addition, poisonous substances in spray form can be very harmful.

A number of substances can cause dermatitis, which is an inflammation of the skin. Contact with strong chemicals, certain cosmetics and poisonous plants causes the skin to become red and itchy and may produce blisters. For example, the sap of poison ivy, oak and sumac will cause a serious skin rash in sensitive people.

Protection against the harmful ultra-violet rays of the sun is provided by the pigment of the skin called melanin. The melanin pigment is the coloring matter of the skin, and it absorbs ultra-violet light rays from the sun. The amount of melanin pigment varies among races and individuals. For example, the Nordic peoples and other fair-skinned blonds have less pigment than do the Asiatic peoples and other darker-skinned brunettes. Skin color is inherited. Tanning, upon exposure to the sun, increases the amount of melanin pigment in the skin. Thus, the darker races are more responsive to ultra-violet light and produce more and darker pigment, or they tan darker.

The hair, the nails, the sebaceous (oil) glands and the sweat glands are called the appendages of the skin. Hair also has general protective functions. The eyebrows and eyelashes help to prevent small particles from entering the eyes. Eyebrows also prevent perspiration from freely flowing into the eyes. The hairs of the nose and ears, as well as the waxy secretion of the ceruminous glands in the ears, help to trap small particles and prevent their entry into the body. Hair on the scalp possibly provides some additional protection against injuries from blows to the scalp.

Among the protective functions of the skin is the prevention of injury to the more fragile organs located within the body.

2. The skin is involved in adjustment to the environment.

The skin contains many nerve endings or receptors for the nervous system. These receptors alert us to changes in our environment which could be harmful if not detected. Hence, the skin's sensitivity to pain, touch, pressure and temperature permits the body to adjust itself to environmental changes.

3. The skin is involved in the manufacture of Vitamin D.

The ultra-violet rays of the sun or of sun lamps convert cholesterol in the skin tissues to Vitamin D, which is needed by the body for healthy bone development. Ultra-violet rays are filtered from sunlight by clothing, fog, smoke and window glass.

4. The skin is involved in the regulation of body temperature.

The skin helps to maintain proper body temperature in several ways:

a) Sweat glands (sudoriferous glands).

The sweat glands remove waste from the body in the form of perspiration. They extract water and salt wastes from the blood and release them through the tiny outlets on the skin surface called pores. These openings are countless; there are millions in the skin of an adult, especially in the hands, the feet, the forehead and the armpits (axillae). Perspiration also helps to control the temperature of the body.

b) Change (adjustment) in blood vessel size.

If the body becomes too warm, the small blood vessels within the skin (dermal capillaries) become larger, i.e., expand or dilate, and more blood flows to the surface of the skin. The sweat glands then have more blood from which to remove water and other materials. Therefore, they pour out more perspiration. As the perspiration evaporates from the skin it carries heat with it, and the body is cooled. When more heat must be lost from the body, more perspiration flows and is evaporated, thereby increasing the cooling effect upon the body, just as wetting the porch roof or the sidewalk makes the surrounding air cooler on a hot summer day.

When the body is chilled, the dermal capillaries become smaller, i.e., constrict, and thus prevent the loss of body heat.

Optional Activity

You may wish to ask your teacher for additional readings on the functions of the skin.

(Activity 2)

Observe your own body and investigate different kinds of skin discolorations. Investigate the cause which brings about these changes. _____

_____

_____

Feedback

If you choose to observe your skin, you will be observing many kinds of physiological changes within the body. Discuss your findings with your teacher.

Optional Feedback

Compare the findings of your skin observations with the observations of your classmates. Discuss these findings with your teacher. _____

_____

_____

_____

_____

_____

(Activity 3)

Investigate different types of suntan lotions and determine why some lotions do a better job than others.

_____

_____

_____

_____

_____

Optional Activity

Observe your skin as you perspire. Determine if, under this condition, your body loses or retains heat. _____

_____

_____

_____

_____

_____

(Activity 4)

The following elements and questions will check what you have learned about the functions of the skin:

"SELF CHECK"

1. List the three main functions of the skin:

   1) _____
   2) _____
   3) _____

2. (true or false) Normal healthy skin has different kinds of bacteria and fungi living on its surface.

   true _____ false _____

3. The substance which protects the skin from ultra-violet sun rays is:

   a) tyrosine
   b) tyrosinase
   c) carotene
   d) melanin

4. Body heat loss can be lessened by:

   a) enlargement of the blood vessels (dilation)
   b) narrowing of the blood vessels (constriction)
   c) increased perspiration or sweating

5. A highly infectious skin condition causing pus-filled, moist sores is: _____

6. A fungal infection that attacks the skin between the toes, forming moist, weepy spots that burn and itch is called: _____

7. Which of the following vitamins is manufactured by the skin?

   a) vitamin B
   b) vitamin C
   c) vitamin K
   d) vitamin D

   (Circle the correct answer.)

8. Sense organ receptors in the skin permit the body to adjust to _____ changes.

9. The skin protects the body from certain elements by serving as a barrier against them. Name three:

   1) _____
   2) _____
   3) _____

10. The skin helps to regulate body temperature by the secretions of the _____ glands, the adjustment of the size of _____, and the fat layers which serve as _____.

11. The term which applies to the inflammation of the skin is: _____.

12. (true or false) Skin color is inherited.

true _____ false _____

Feedback

Compare your written answers on the "Self Check" with the model answers.

MODEL ANSWERS

1. The three main functions of the skin are protection, temperature regulation and sensation.

2. (true)

3. The pigment melanin protects the skin from ultra-violet rays.

4. Body heat loss can be lessened by the narrowing of the blood vessels (constriction).

5. A highly infectious skin condition is impetigo.

6. Athlete's foot is a fungal infection which attacks the skin between the toes.

7. Vitamin D is manufactured by the skin.

8. Sense organ receptors in the skin permit the body to adjust to environmental changes.

9. The skin serves as a barrier against chemicals, diseases, ultra-violet rays (light), and mechanical elements.

10. The skin helps to regulate the body temperature by the secretions of the sweat glands, the adjustment of the size of blood vessels, and the fat layers which serve as insulation.

11. Dermatitis is the inflammation of the skin.

12. (true)

Learning Experience III

Overview

Enabling Objective Upon completion of the required readings, list and describe the structural layers of the skin and the type of tissue contained within.

Activity 1 You will be reading the information sheet describing the structural layers of the skin.

Optional Activity You may wish to ask your teacher for additional readings on the integumentary system.

Activity 2 You will be demonstrating knowledge of the skin layers by completing the "Self Check," p. 13.

Feedback You will be evaluating your performance by comparing your completed "Self Check" with the "Model Answers," p. 14.

Activity 3 For information on the structural layers of the skin and the types of tissue contained within, read the "Information Sheet on the Structural Layers of the Skin."

(Activity 1)

Information Sheet on the Structural Layers of the Skin

The skin is composed of two layers: the dermis and the epidermis.

The epidermis is the outermost layer of the skin. This epithelial portion of the skin is itself stratified. The outer cells, or horny layer, are flat and dead; they are constantly being shed and replaced by active cells from the lower layers. These cells are continually rubbed off by the friction of bodily movement, bathing, etc. The epidermis contains the melanin pigment which in part casues skin color. There are no blood vessels in the epidermis. Hair and nails are special outgrowths of the epidermis. Epithelial ridges and lines give uniquely identifiable fingerprints and footprints to each individual.

The dermis, innermost layer of the skin, lies immediately beneath the epidermis. Often called the "true skin," the dermis has a framework of thick elastic connective tissue. It contains blood vessels, nerve fibers, oil and sweat glands, hair follicles and receptor organs for sensations of touch, pain, heat and cold.

Beneath the skin is a layer of tissue called subcutaneous tissue, which connects the skin to the outermost muscles. This layer is composed of elastic and fibrous connective tissue and adipose, or fat tissue.

Optional Activity If you wish to read additional information about the integumentary system, contact your resource person for other materials.

(Activity 2)

The following statements and questions check what you have learned about the skin layers.

"SELF CHECK"

1. List the two main structural layers of the skin.

   1) _____
   2) _____

2. Which portion of the integument produces new living skin cells?

   _____

3. Which of the following skin structures are <u>not</u> made of living cells?

   a) nails
   b) hair
   c) sweat glands
   d) blood vessels

   (Circle the correct answers(s).)

4. The skin tissue in which the blood vessels and nerves are located is the:

   a) dermis
   b) epidermis

   (Circle the correct answer.)

5. Which layer of the skin contains the melanin pigment which in part causes skin color?

   a) dermis
   b) epidermis

   (Circle the correct answer.)

6. _____ and _____ are special outgrowths of the epidermis.

7. Which layer of the skin gives us our unique fingerprints and footprints?

   a) dermis
   b) epidermis

   (Circle the correct answer.)

Feedback

Compare your written answers on the "Self Check" with the model answers given below:

MODEL ANSWERS

1. The epidermis and the dermis are the main structural layers of the skin.

2. The dermis produces new living cells.

3. Hair and nails are not made of living cells.

4. The dermis contains the blood vessels and nerve tissue.

5. The epidermis contains the melanin pigment.

6. Nails and hair are special outgrowths of the epidermis.

7. The epithelial ridges and lines of the epidermis give us our footprints and fingerprints.

Learning Experience IV

Overview

Enabling Objective After completing the required reading, identify and describe the structure of an individual hair and an individual nail; identify and describe their functions as parts of the human body.

Activity 1 You will be reading the "Information Sheet on the Hair and Nails," p. 15.

Optional Activity You may wish to ask your resource person for additional illustrations and readings on the human hair and nails.

Activity 2 Examine your own fingernails. Using a pair of nail clippers, cut your toenails and fingernails, and determine why you don't feel pain. Calculate how much growth takes place in one month.

Feedback If you choose to cut your nails, discuss your findings with your teacher.

Optional Feedback Compare your nail-cutting findings with your classmates' observations. Discuss your findings with your resource person.

Optional Activity Investigate the subject of balding. What causes balding? Can women become bald? Can hair grow back on a bald scalp?

Activity 3 For information regarding the human hair and nails, read the "Information Sheet on the Hair and Nails."

(Activity 1)

Information Sheet on the Hair and Nails

Hair is one of the so-called appendages of the skin. The hair is a slender filament of modified dead epithelial tissue. It is distributed all over the body, with the exception of the soles of the feet and the palms of the hands. Hair first appears on the fetus (unborn infant) at about the fourth month as a soft down called lanugo. This early hair drops off after birth and is replaced with adult-type hair.

Each individual hair consists of a root embedded in the dermis and a hair shaft projecting from the root through the epidermis. The base of the root widens to form a bulb.

The hair shaft and root grow in a hollow tube of epithelial cells known as the follicle.

Small muscles, arector pili, are attached to the follicle and can move the hair shaft in response to temperature (cold) and emotion (fright). The small bumps caused by the movement of the hair shaft are commonly called "gooseflesh."

All growth in hair occurs at the base of the hair root. Newly formed hair cells gradually become lengthened and filled with keratin to form a completed hair. Since the keratinized hair cells are not alive, cutting the hair shaft does not influence its growth. All body hair, with the exception of that on the face and head, reaches a certain fixed length and then stops growing. Growth occurs at the rate of about 1/3 millimeter per day.

When a new hair forms, it pushes the older hair out as it makes its way to the skin surface. In the lower animals, hair plays an important pro-

tective role, although in humans its role as a protector is limited to areas around the eyes, ears and nose. Eyebrows prevent perspiration from freely flowing into the eyes. Hair on the scalp provides protection against injuries from blows to the skull.

Nails are abundant growths of horny keratinized cells which are found on the dorsal surfaces of the distal ends of the fingers and toes. Nail growth is continual, averaging about 1 millimeter per week. It takes from four to six weeks for a completely new nail to form. Toenails generally grow more slowly than do fingernails.

Blood vessels in the dermis just under the nail provide the characteristic pink coloration. The base of the nail, where it connects to the finger or toe, is covered by a layer of skin called the cuticle. Nails provide some protection for the extremities.

Optional Activity — You may wish to ask your resource person for additional illustrations and readings on the human hair and nails.

(Activity 2)

Examine your own fingernails. Using a pair of nail clippers, cut your fingernails and toenails, and determine why you don't feel pain. Calculate how much growth takes place in one month. _____

_____

Feedback

If you choose to cut your nails, discuss your findings with your resource person.

Optional Feedback

Compare your nail-cutting findings with your classmates' observations. Discuss your findings with your resource person.

Optional Activity

Investigate the subject of balding. What causes balding?

_____

_____

_____

Can women become bald?

_____

_____

Can hair grow back on a bald scalp?

_____

_____

(Activity 3)

The following statements and questions check what you have learned about the hair and nails:

"SELF CHECK"

1. What is the name of the hollow tube of epithelial cells in which the hair shaft and root grow?

_____

2. How long would it take a fingernail to grow one centimeter? (Clue: one centimeter = ten millimeters)

a) one week
b) one month
c) ten weeks
d) ten months

(Circle the correct answer.)

3. Name two places on the body which are without hair.

_____

4. Hair first appears on the fetus as

a) lanugo
b) club hair
c) cuticle
d) corium

(Circle the correct answer.)

5. What is the function of hair and nails on the human body?

_____

6. Goose-flesh is caused by the _____ moving the hair shaft.

7. The pink color of the nail bed is caused by:

a) pigment cells in the dermis
b) blood vessels in the dermis
c) the pigment carotene
d) the enzyme tyrosinase

(Circle the correct answer.)

Feedback

Compare your written answers on the "Self Check" with the model answers given below:

MODEL ANSWERS

1. The hair shaft and root grow in a hollow tube of epithelial cells known as the follicle.

2. A fingernail will grow one centimeter in ten weeks.

3. The soles of the feet and the palms of the hands are without hair.

4. Hair first appears on the fetus as lanugo.

5. The hair and nails serve to protect the body.

6. Goose-flesh is caused by small muscles, the arector pili, moving the hair shaft.

7. The pink color of the nail bed is caused by blood vessels in the dermis.

Learning Experience V

Overview

Enabling Objective: After completing the required reading, identify and describe the glands within the skin. Explain the significance of their production of bodily secretions.

Activity 1: You will be reading the "Information Sheet on Glands Within the Skin."

Optional Activity: You will be demonstrating knowledge of the glands within the skin by completing the "Self Check," p. 20.

Feedback: You will be evaluating your performance by comparing your completed "Self Check" with the model answers on p. 21.

(Activity 1)

Information Sheet on Glands Within the Skin

Several types of glands form in the skin and produce important bodily secretions. Each of these structures is an example of an exocrine gland, since their products are secreted through a duct or tube onto the surface of the skin. Sebaceous glands secrete oil (sebum). They occur on all skin surfaces except on the palms and soles. They are mostly found on the face and scalp. They are small sacs in the dermis with outlets attached to the hair follicles. This oil (sebum) lubricates the skin and hair and prevents it from becoming brittle, but can also plug the outlets (ducts) of the sebaceous glands. Certain bacteria find these plugged glands suitable for growth. This condition is generally referred to as acne.

Sudoriferous (sweat) glands secrete sweat, or perspiration. They are simple coiled tubes which are located in the dermis or in the subcutaneous layer beneath the dermis. Most sweat glands have an outlet (duct) which opens into pores on the surface of the skin. However, some sweat glands have ducts which are connected to hair follicles. These glands are found in the axilla (armpits) and around the male and female genitalia. When bacteria grow in these areas of the body they react with the chemical secretions of the sweat glands and cause body odor.

The glands which open directly to the skin are found over the body, and particularly on the palms and the face. These glands produce "true sweat." The inorganic salt found in sweat is responsible for the salty taste.

Ceruminous glands secrete wax. These are small glands located in the auditory meatus, the passage from the outer ear to the ear drum. The wax keeps dust, microorganisms and other materials from harming the sensitive inner parts of the ear.

Optional Activity: If you wish to read additional information about the glands within the skin, contact your resource person.

(Activity 2)

The following statements and questions check what you have learned about the glands within the skin:

"SELF CHECK"

1. Glands which form in the skin and produce important bodily secretions are called:

   a) endocrine glands
   b) exocrine glands

   (Circle the correct answer.)

2. List the three types of glands found in the integumentary system.

   1) _____
   2) _____
   3) _____

3. What is the scientific name for oil glands?

   _____

4. What is the scientific name for sweat glands?

   _____

5. What is the scientific name for wax glands?

   _____

6. A bacterial infection of the skin caused by the plugging of sebaceous glands is generally known as:

   _____.

7. _____ _____ causes sweat to have a salty taste.

8. Cerumin (wax) protects the:

   a) inner part of the ear
   b) outer part of the ear

   and ear drum.

   (Circle the correct answer.)

Feedback

Compare your written answers on the "Self Check" with the model answers given below:

MODEL ANSWERS

1. Exocrine glands form in the skin and produce bodily secretions.

2. Sebaceous (oil), ceruminous (wax), and sudiriferous (sweat) glands are found in the integumentary system.

3. The scientific name for oil glands is sebaceous glands.

4. The scientific name for sweat glands is sudirifereous glands.

5. The scientific name for wax glands is ceruminous glands.

6. Acne is caused by plugging of the sebaceous glands.

7. Sodium chloride is responsible for the salty tast of sweat.

8. The inner ear and ear drum are protected by cerumin (wax).

STUDENT PERFORMANCE ASSESSMENT FORM

THE INTEGUMENTARY SYSTEM (Skin)	LEVEL of PERFORMANCE	
	Satisfactory	Unsatisfactory
Demonstrated knowledge of the Integumentary System.....		
Defined the Integumentary System.....		
Listed the Functions of the Skin.....		
Identified the anatomical features of a microscopic section of the human skin.....		
Described the process of cell mitosis.....		
Listed the functions of hair on the human body.....		
Identified and described a single hair structure.....		
Identified and described the structure of the nail.....		
Defined and described the types of glands formed in the skin.....		
Explained the significance of skin glands in the production of body secretions according to their location, function or action.....		